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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/715,041	11/20/2000	Sang-Jun Choi	SEC.741	6853

7590 09/16/2003

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EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/715,041

Applicant(s)

CHOI ET AL.

Examiner

Yvette C. Thornton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,6 and 9-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,6 and 9-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

This is written in reference to application number 09/715041 filed on November 20, 2000.

Response to Amendment

1. Claims 3 and 7 have been cancelled. Claims 1-2, 5-6 and 9-18 are currently pending.
2. The cancellation of the said claim is sufficient to overcome the claim objection set forth in the previous office action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-2, 5-6 and 9-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The newly added limitation to independent claims 1 and 5 which requires $m+n=1$ constitutes new matter. The examiner has found no support in the specification to support such a limitation. The specification as written only requires $m/(m+n)$ to be in the range of 0.5-0.8 (spec. pg. 4, l. 1-2; pg. 6, l. 3-8).

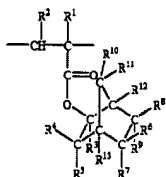
Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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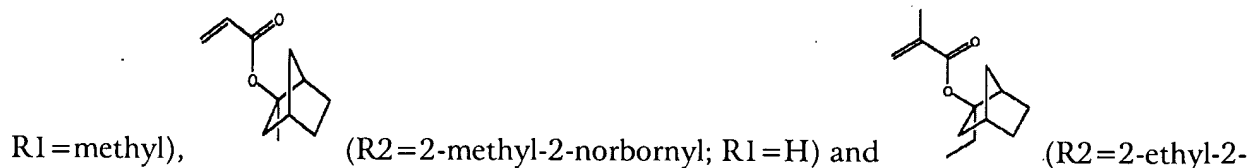
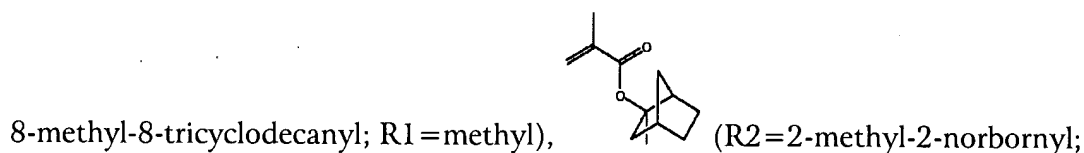
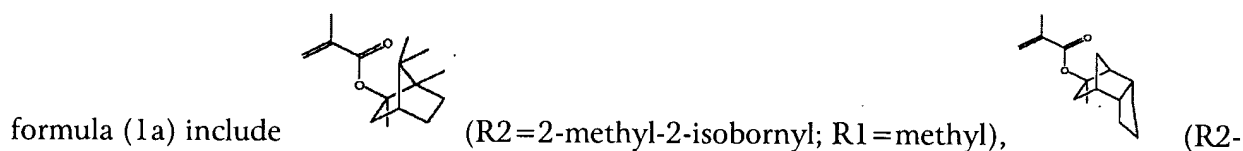
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-2, 5-6, 9-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsho et al. (US 6312867 B1). Kinsho teaches a polymer comprising units of an ester compound having the given general formula (1a) and having a weight average molecular weight of 1,000-500,000 (c. 2, l. 64-67). Formula (1a) has the following



structure

The said polymer may further comprise recurring units of at least one of formulae (2a) to (13a) (see c. 3, l. 20-c. 5, l. 22). Illustrative non-limiting examples of

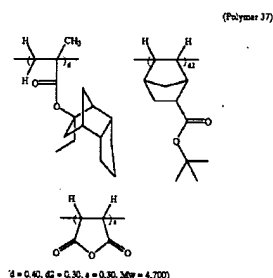


norbornyl; R1=methyl), all which meet the limitations of the first monomer of the instant claims (see c. 7, l. 66-c. 9, l. 35; c. 44, l. 40-c. 47, l. 29). Kinsho further teaches a resist

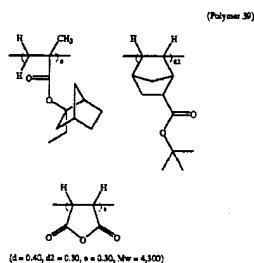
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composition comprising the said polymer, a photoacid generator and an organic solvent (c. 21, l. 10-15).

7. Kinsho exemplifies the use of polymers 37 and 39 having the following structures:



(c. 59, l. 1-20) and



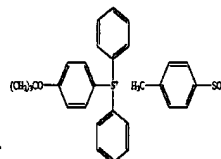
, wherein R1 is methyl and R2 is

8-ethyl-8-tricyclodecanyl and 2-ethyl-2-norbornyl, respectively. Although the said copolymers do not fall within the claimed molar range, it would have been obvious to one of ordinary skill in the art to vary the taught components within the range disclosed by Kinsho. Kinsho clearly teaches that it is more preferable for the polymers of the taught invention to contain (I) 30-80 mol% of units of formula (1a) derived from formula (1), (II) 5-90 mol% of units of one or more types of formulae (2a) to (13a) and optionally (III) 0-50 mol % of one or more types derived from the additional monomers (iii) (c. 20, l. 18-34).

8. The examiner notes the presence of the exemplified monomer "d2", which is not claimed by the applicant. The examiner is of the position that the "consisting essentially of" language of the instant claims does not prohibit the presence of this monomer. The "consisting essentially of" language covers the embodiments discussed in the specification. Page 6 of the specification clearly discloses that, "another (meth)acrylate monomer maybe further added to form a terpolymer" (lines 9-10). Furthermore, it would have been obvious to one of ordinary skill in the art to eliminate the taught "additional" monomer of the given examples because Kinsho teaches that they are optional components

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9. Kinsho further exemplifies photoresist compositions (I-37 and I-39) comprising



polymers 37 and 39 admixed with a photoacid generator (PAG1), which is a triarylsulfonium salt; tributylamine, which is an organic base; and a solvent PGMEA. The preferred photoacid generators include triphenylsulfonium trifluoromethanesulfonate (triflate), triphenylsulfonium p-toluenesulfonate and bis(n-propylsulfinyl) diazomethane (c. 26, l. 8-39; see also PAG2 c. 69, l. 30-40). Kinsho further teaches that especially preferred basic compounds include tertiary amines (triethylamine, tributylamine, tri-isobutylamine and trioctylamine); aniline derivatives and hydroxyl group-bearing nitrogenous compounds (c. 35, l. 26-35). The given examples use tributylamine (TBA), triethanolamine (TEA), trimethoxymethoxyethylamine (TMMEA) and trimethoxyethoxymethoxyethylanine (TMEMEA) (c. 70, l. 56-59). Kinsho also teaches that the resist composition of the taught invention may include as an optional ingredient, a surfactant that is commonly used for improving the coating characteristics. Optional ingredients may be added in conventional amounts so long as this does not compromise the objects of the invention. Nonionic surfactants are preferred, examples of which include perfluoroalkylpolyoxyethylene ethanols, fluorinated alkyl esters and fluorinated organosiloxane compounds (c. 41, l. 45-62). It is the examiner's position that perfluoroalkylpolyoxyethylene ethanol meets the limitation of a polyether as set forth in instant claim 17.

10. One of ordinary skill in the art would have been motivated by the teachings of Kinsho to develop a photoresist composition comprising the preferred embodiments which includes a

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polymer such as those exemplified by polymer 37 and 39 with or without the taught optional additional monomer; a photoacid generator such as that exemplified by PAG2; an organic base such as TEA; a non-ionic surfactant such as perfluoroalkylpolyoxyethylene ethanol; and a solvent to form a photoresist composition which is very low in formation of fine particles (c. 2, l. 8-11) and therefore would improve the yield in the manufacture of integrated circuits (c. 1, l. 51-c. 2, l. 5). Furthermore, it would have been obvious to one of ordinary skill in the art to vary the required monomer units within the range disclosed by Kinsho.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 16 and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsho as applied to claims 1-2, 5-6, 9-15 and 17 above, and further in view of Hosaka et al. (US 5,405,720 A). Kinsho, as discussed above, teaches all the limitations of the instant claims except the specific amount of surfactant to be used in the taught photoresist composition (instant claim 16) and the use of polyethylene glycol as a suitable surfactant (instant claim 18). Kinsho does however, teach that a surfactant may be added in conventional amounts so long as this does not compromise the objects of the invention and that nonionic surfactants are preferred (c. 41, l. 45-62). Hosaka teaches a radiation sensitive composition, which may further contain a surfactant. Hosaka discloses that examples of non-ionic surfactants include

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polyoxyethylene alkyl ethers, polyethylene glycol dialkyl ethers and polyoxyethylene alkyl phenol ethers (c. 6, l. 61-c. 7, l. 7). The amount of surfactant incorporated into the composition is usually 2% by weight or less based on the solids content of the composition (c. 7, l. 23-28). Hosaka serves to establish that polyethylene glycol dialkyl ether is a well-known and conventional non-ionic surfactant. One of ordinary skill in the art would have been motivated by the teachings of Kinsho to use any well-known non-ionic surfactant in conventional amounts such as those taught in Hosaka in the taught photoresist composition of Kinsho in order to improve the coatability of the taught composition.

Response to Arguments

13. Applicant's arguments with respect to the instant claims have been considered they are not persuasive. Applicants argue that the prior art reference of Kinsho exemplifies a terpolymer comprising monomeric ratios outside the scope of the claimed invention. The examiner however is of the position, as stated above, that although the exemplified copolymers do not fall within the claimed molar range, it would have been obvious to one of ordinary skill in the art to vary the taught components within the range disclosed by Kinsho. Kinsho clearly teaches that it is more preferable for the polymers of the taught invention to contain (I) 30-80 mol% of units of formula (1a) derived from formula (1), (II) 5-90 mol% of units of one or more types of formulae (2a) to (13a) and optionally (III) 0-50 mol % of one or more types derived from the additional monomers (iii) (c. 20, l. 18-34).

14. As discussed above, the examiner is of the position that the "consisting essentially of" language of the instant claims does not prohibit the presence of an additional monomer. The "consisting essentially of" language covers the embodiments discussed in the specification.

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Page 6 of the specification clearly discloses that, "another (meth)acrylate monomer maybe further added to form a terpolymer" (lines 9-10) (see MPEP 2111.03). Furthermore, it would have been obvious to one of ordinary skill in the art to vary the required monomer units within the range disclosed by Kinsho.

15. The examiner maintains the rejection of record.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

17. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.


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19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

20. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.

yct

September 11, 2003


JANET BAXTER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700